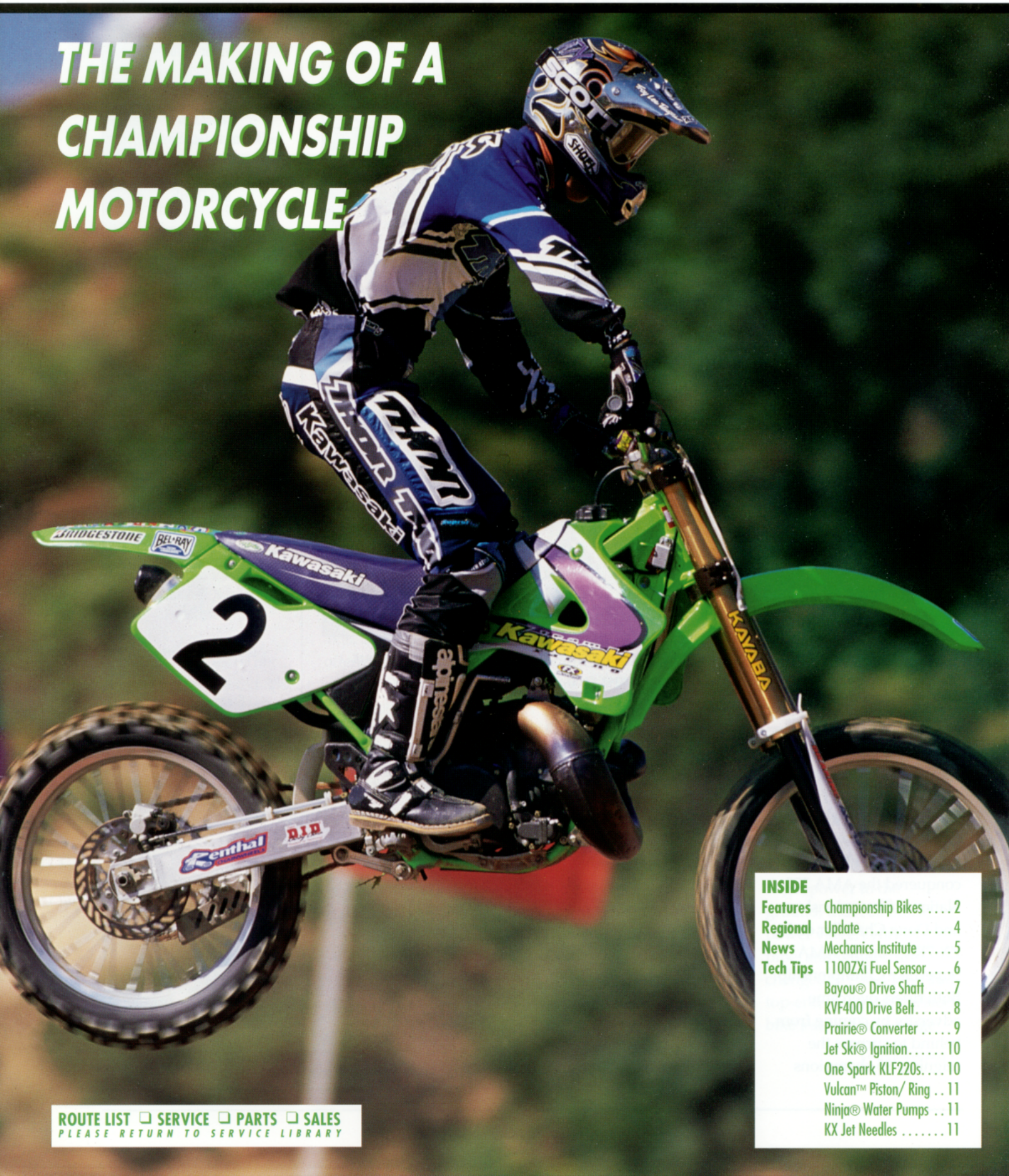
K-TECH NEWS

WINTER 1996 THE **KAWASAKI** TECHNICAL MAGAZINE VOL. 9, NO. 4

THE MAKING OF A CHAMPIONSHIP MOTORCYCLE



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The Bikes Behind The Championships

Part I of II

by John Griffin
Instructional
Designer/Instructor

1996 proved to be a great year for Kawasaki. Jeff Emig and his KX250 conquered the AMA 250cc National Championship and Doug Chandler on his ZX-7RR won the AMA Superbike Championship. Both riders overcame adversity by coming from behind to surpass the reigning '95 champions late in the season. In this issue the motocross race team tuners explain the development of Jeff Emig's bike. Rob Muzzy will track the success of Chandler's ZX-7RR in our Spring edition.

K-Tech News interviewed team tuners Norm Bigelow, Rick Asch, and Brett Leef for their input on Emig's bike, as well as Emig's personal mechanic, Jeremy Albrecht. The team said the '96 KX250 is a good basis for a race bike because it has few weaknesses. It has a strong motor and good layout. The stiff frame provides quick turning, goes straight, and stays flat through the whoops. Since the bike was similar to the '95, the team had good base settings and knew the tricks to make it great.

The race bike starts life as a production unit in a crate just like the dealers get. The bike is disassembled and built from the ground up. The chassis is stripped of paint, inspected, then welded in strategic locations like the steering head, linkage area,

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footpeg bosses, and engine mounts (see *Motocross Journal*, August '96). Braces are welded to the frame cross tube near the top shock mount for rigidity and endurance. These modifications are needed to endure the factory rider's punishment over the skyscraper jumps that litter today's tracks.

The jumbo, late production '96 swingarm provided a surprising increase in performance. The 18mm longer swingarm puts more weight on the front tire for extra bite in the corners; the added wheelbase allows better traction; and extra strength puts power to the ground without twisting. A longer and more sturdy chain guide (like the '97's) was added.

The team reduces chances of DNFs by replacing parts on a schedule whether or not they appear to need it. The new swingarm is replaced less often than the smaller arm at six-race intervals along with the frame. Kayaba works forks grace the front end with stiffer fork tubes, triple clamps, axle, and axle clamps offering rigidity to go exactly where Emig points them. The supple, stiction-free performance of the forks must be felt to be believed. The rear end is supported by a works Kayaba shock offering high and low speed compression damping adjustment. It features a hard anodized aluminum body that is threaded to the cast upper portion for quicker and less expensive rebuilds. Longer linkage pull rods are used to slightly lower the rear end and make the action softer initially and firmer toward the end of the stroke.

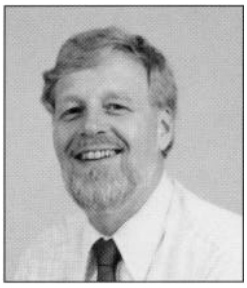
If you are not in the top five with McGrath in the first corner, your race is usually over. The team apparently used this thinking to develop the race motor. The power was changed to be more tractable and linear for smooth, predictable acceleration. Albrecht explained how the team one day timed Emig's starts with a stopwatch over and over (like 70 times) to improve engine settings. It became apparent that the tractable, smooth power that snares holeshots also gives consistently fast laps on the track.

The changes on the '97 KX250 mimic what the team did to the race bike. The crank has more inertia to get power to the ground; the reed block, power valve, cylinder, pipe, and ignition are changed to boost low- and top-end matching the stock bike's strong mid-range

Continued on page 12

Titanium axle, magnesium brake carrier, billet aluminum hub, carbon fiber guard... trickness defined.

Even the cylinder and cylinder head studs are titanium!



NORTH & EAST

Upcoming Training Classes

The National Training Schedule has been mailed to our dealer network and your dealership should have a copy available. Be sure all of your service personnel read the bulletin carefully before enrolling in the class selections listed.

To better serve the needs of our dealer service departments, course offerings have been redesigned and are offered at two levels-professional and master. Certain criteria must be met in order to attend the master classes.

If you have any questions prior to enrolling any of your dealership personnel, please call me at the East region office (908-469-1221).

Also listed in the training bulletin (TR 96-01) are training materials that can be reviewed at the dealership prior to attending classes. The phone number for obtaining any of these materials that your dealership does not already have available is listed in the bulletin.

If you can't find the new training schedule, or you need extra copies, they are available from K-Fax at 714-460-5663. Order document #1305.

I look forward to talking with you and seeing you in class soon!◆

Fred DeHart
201 Circle Drive N. #107
Piscataway, NJ 08854
(908) 469-2221

SOUTH & CENTRAL

Gasoline Safety

I recently came across an article in a newsletter published by the Georgia Recreational Trail Riders Association concerning the hazard of fueling a gas can while sitting in the back of a pickup truck. Apparently plastic bed liners do not provide a ground and the fuel generates static electricity that can cause the fumes to ignite.

This was the first I had heard of this, so I did some research on the subject. I contacted Chevron USA in Richmond, Calif., and they were very helpful in explaining to me the nature of this hazard. They gave me permission to reprint their following Technical Bulletin. This is important information that you should be aware of, since it is common practice although unsafe to refuel gas cans while they are in the back of a pickup. Be sure to pass this information along to your customers, too!◆

Walter Rainwater
6110 Boat Rock Blvd. S.W.
Atlanta, GA 30378
(404) 349-2000

CHEVRON TECHNICAL BULLETIN

Filling Metal Gasoline Cans Placed on Plastic Surfaces Creates Fire Danger

Several vehicle fires have resulted at Chevron service stations os o result of customers filling metal portable gasoline containers (gas cons) placed on plastic surfaces. The fires hove involved o gas con in the bock of o pick-up truck with o plastic bed liner. The insulating effect of the plastic surface prevents the static charge generated by the gasoline flowing into the gas con from grounding. As static charge builds, it can create a static spark between the gas con and the fuel nozzle. When the spark occurs in the flammable range in the gasoline vapor space near the open mouth of the gas can, a fire occurs.

How to fill a gas can to minimize the danger of fire:

- **Use only an approved container.**
- **Do not fill any container while it is inside a vehicle's trunk, pickup bed, or on any surface other than ground. This includes pickup trucks, sport-utility vehicles, vans, etc.**
- **Remove the approved container from the vehicle and place it on the ground a safe distance away from the vehicle, other customers and traffic.**
- **Keep the nozzle in contact with the can during filling.**
- **Never use a latch-open device to fill a portable container.**
- **Follow all other safety procedures, including no smoking.**

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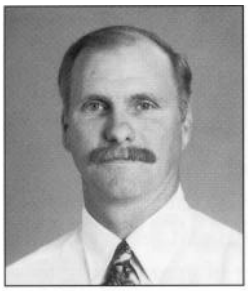


WEST

Skill level Training for Technicians

We have received a number of calls from dealer technicians asking about the different training levels of our new classes and who can attend them. In a nutshell, we now have two levels of classes: professional for intermediate level technicians, and master for more experienced technicians.

The professional level classes cover a broad range of assembly and disassembly, adjustments, maintenance and some troubleshooting techniques. Each class is designed to provide the technician with good hands-on familiarization with a product segment such as motorcycles or MULE™ utility vehicles.

The master level courses are for more advanced technicians and don't go into basic theory or assembly/disassembly. For this reason, most master courses have prerequisites-other classes the technician must have attended first. Master classes offer more detail on specific systems to help the technician understand and troubleshoot them.

In addition, we will be offering some specialty courses (such as Team Green race preparation) that anyone can attend. See bulletin TR 96-01 for more details and the National Training Schedule for class dates.◆

Robert Taylor
9950 Jeronimo Road
Irvine, CA 92618
(714) 770-0400

The Kawasaki Specialist Program

Technical Training Now Available through the Motorcycle Mechanics Institute

Kawasaki Motors Corp., U.S.A., has formally endorsed Motorcycle Mechanics Institute since 1989 and during the last seven years, KMC and MMI have worked together on a variety of projects. KMC has helped keep MMI up-to-date on much needed information and Kawasaki products. This arrangement has always been beneficial to MMI and Kawasaki, but an actual Kawasaki elective has been noticeably absent at MMI. Well, that is about to change-on January 27, the first K-Tech Specialist class will begin at the MMI Phoenix, Ariz., campus.

The K-Tech Specialist Program will be six weeks long and divided into five sections. The first section is the introduction to Kawasaki, the K-Tech program and the K-Share network. Representatives from KMC will be participating in this section.

The other four sections are motorcycles, ATVs, MULEs, and personal watercraft. In this program, the students will spend about 1/3 of their time in the classroom and about 2/3 in the lab for hands-on training.

KMC has sent MMI classroom equipment including manuals, tools, microfiche, service bulletins, computer software, spare engines and parts. Kawasaki also sent 54 vehicles including a variety of motorcycles, ATVs, personal watercraft and MULEs.

With all the support Kawasaki has offered so far, it is obvious they are behind the program 100%. All Kawasaki's enthusiasm has been contagious and the staff and the students at MMI are very excited about the addition of the new K-Tech Specialist Program. What does this mean? MMI will be able to provide qualified Kawasaki technicians for dealers in the very near future.◆

Tom Dahl is an instructor of the K-Tech Specialist class at the Motorcycle Mechanics Institute in Phoenix, Ariz.

Welcome Parts Data Coordinator

"Parts Data Coordinator"... Everyone needs a title, and as of November 1996 that will be the title attached to my desk here at the Irvine, Calif., corporate offices. What does a Parts Data Coordinator do, you might ask? Well, my responsibilities will include processing parts illustrations and information from our sources in the U.S. and Japan to produce microfiche and parts catalogs; keeping your Micro-K subscriptions running smoothly; and most importantly to you at the dealerships, I am here to help with any of your questions, concerns or problems that you might have with any of your parts publications. Also at Kawasaki, as in the rest of the business world, we are exploring more and more into the era of digital information. Our goal for the future is to provide detailed, accurate information the fastest way possible, whether it's on CD, the internet or wherever technology is going to take us.

As for my background, most recently I have spent the last year in the tech support shop here at Kawasaki coordinating the use and maintenance of the marketing pool of vehicles. Previously, I worked several years for an aftermarket manufacturer. I was also a Parts Manager at a Kawasaki dealership for seven years. I've experienced first hand many of the situations that you deal with on a daily basis. I am also a die-hard enthusiast. I have been riding off-road and motocross since my single digit years and spent a number of years trying to achieve fame and fortune road racing. Hopefully this experience will help me answer your questions and fill your needs.

Please feel free to contact me for any of your parts publications needs. I look forward to hearing from you.◆

Jeff Hoeppner
9950 Jeronimo Rd.
Irvine, CA 92618
(714) 770-0400, ext. 2573

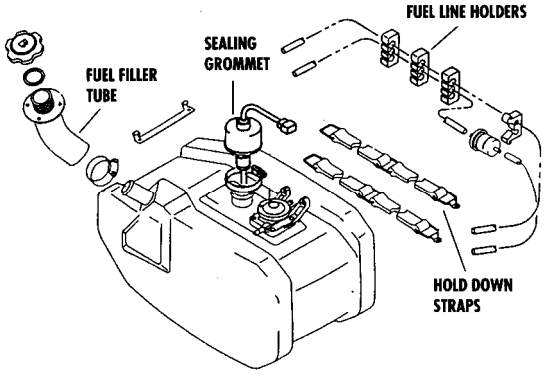
Sayonara, David

David Pyle relinquished his position as Parts Data Coordinator to accept a position as Parts Coordinator for the Indy program at Toyota Race Development U.S.A. This was a tough decision for David since he had been with KMC for 11 years; starting in the parts worehouse, moving to a very successful term with. Team Green, and finally coordinating the Micro-K program in Technical Services. David has many friends in KMC and at Kawasaki dealerships from coast to coast. —*Ed.*

1100 ZXi Fuel level Sensor Removal

by Dave Corey
Writer/Producer

A number of you have called to point out that the 1100ZXi service manual doesn't give a complete explanation for the removal of the fuel level sensor. When a technician is faced with doing this job, one look inside the hull reveals the problem. The fuel tank on the ll00ZXi, with its 14.3 gallon fuel capacity, doesn't leave enough room in the hull to remove the fuel level sensor with the fuel tank in place. With a little experimentation we found what we feel is a satisfactory procedure for fuel level sensor removal. Should you ever be faced with this task we suggest you use the following procedure:



1. Remove the fuel from the fuel tank.
2. Pull the fuel lines free of the holders on the side of the hull. This should allow you to move the tank without having to disconnect all the fuel lines.
3. Loosen the hose clamp and remove the fuel filler tube from the fuel tank.
4. Disconnect the fuel-level sensor lead wire.
5. Loosen the hose clamp and pull the fuel- level sensor sealing grommet free of the gas tank spigot.
6. Unhook the fuel tank hold-down straps.
7. Pull the fuel tank toward the bow about eight inches.
8. Roll the fuel tank on its side, toward the right side of the croft, about 80%.
9. Pull the fuel-level sensor out of the fuel tank. The notch in the flotation material on the right side of the hull will provide the extra clearance needed.
10. Assembly is the reverse of disassembly.

This procedure should take less than 30 minutes.◆

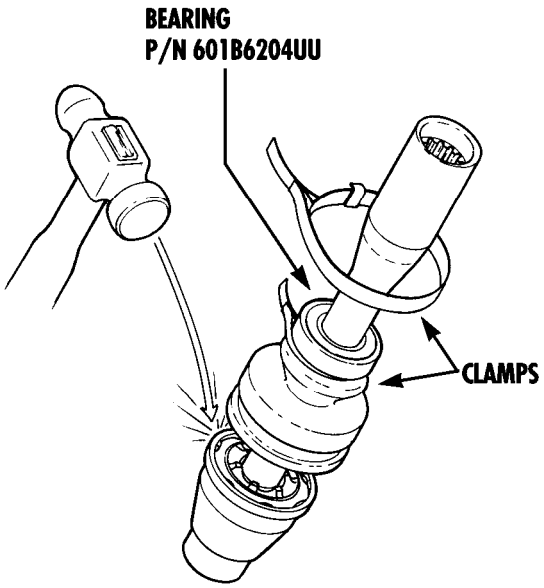
Tips From the Field

Bayou® Rear Drive Shaft Rebuilding

Donnie Margraves from Good Times Cycle Co. in Tyler, Texas, sent us an excellent tip on servicing failed KLF220, 300 and 400 Bayou rear drive shafts. For years Donnie has been saving his customers lots of money rebuilding rear drive shafts when the carrier bearing has failed.

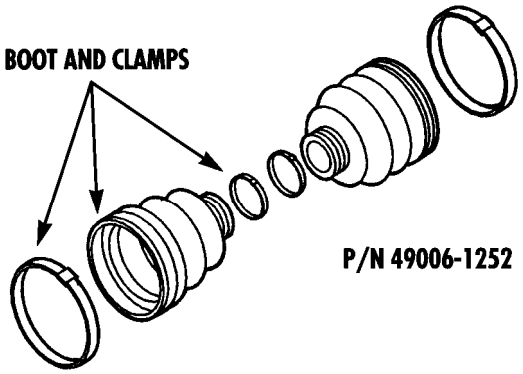
Typically, the carrier bearing fails from water and dirt that enter the swingarm tube after the outer dust boot has been torn. Kawasaki offers the dust boot, but none of the parts for the drive shaft assembly (referred to as the ball joint assembly on the parts microfiche).

Since the drive shaft assembly is an expensive part and the carrier bearing is generally the only thing damaged, Donnie did a little research and experimentation. First, he found that the bearing is a common double-sealed bearing available from Kawasaki under part number 601B6204UU. Of course the trick to replacing the bearing is removing the CV joint from the end of the shaft. As it turns out, that's no big deal either. After removing the CV joint boot clamps and pulling the boot away from the CV joint, Donnie mounted the shaft in his bench vise and gave the CV joint a couple of good whacks with a large hammer. The CV joint popped right off in his hand. The bearing then slides right off the shaft and a new one can be installed. If you are careful removing the CV joint boot clamps, they are easy to use again. Donnie figured out how to do this years ago and they've been rebuilding drive shafts ever since.



We tried this repair here on a few drive shafts and it worked fine; but there is a slight possibility that the splines on the end of the shaft could be damaged by the snap ring when you knock the CV joint off. Donnie says this has happened to him, but only once or twice over the years. And since it only takes a few minutes to disassemble the shaft, you haven't lost anything by trying.

When rebuilding these drive shafts, the CV joint boot is usually not damaged, but occasionally that can be tom, too. *Note: the part number is not shown on the microfiche. Once* again Donnie found something that would work. It turns out that one of the CV joint boots for the front drive (axle) shafts for the KLF300-C (4x4) model fits fine. That boot is available in the boot kit (P/N 49006-1252). The boot kit is not cheap, but it's still a lot less than a drive shaft assembly.

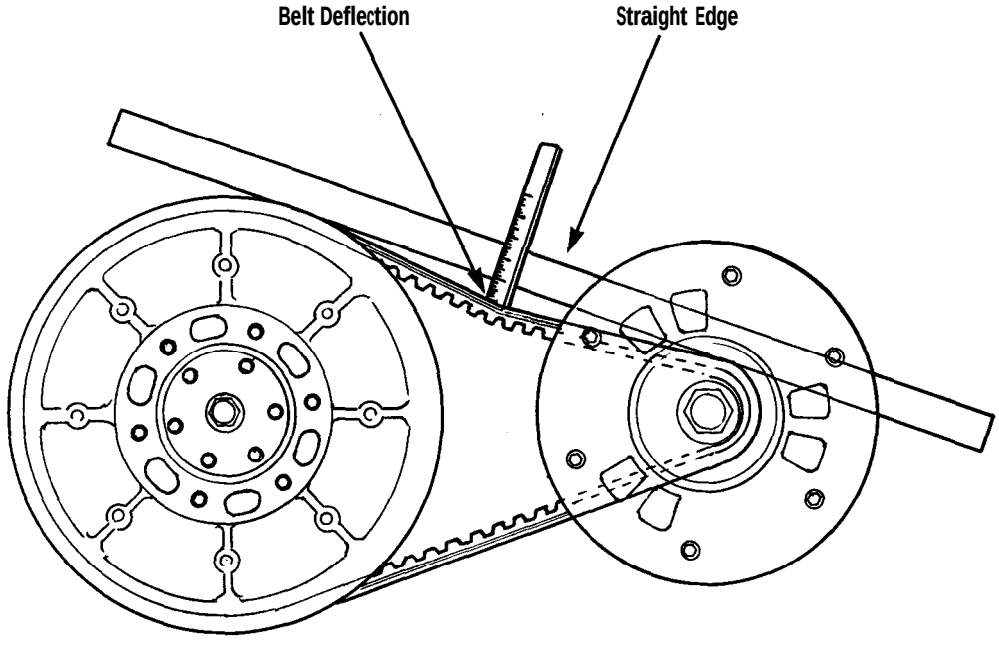


The kit comes with a special non-petroleum CV joint grease. Don't use any other grease or the life of the boot may be shortened.

Thanks for the tip, Donnie! Did the check make it to you by Christmas? ◆

Kawasaki pays $100 for any tip from our dealers that gets printed in *K-Tech News.* Send your tips to KMC, 9950 Jeronimo Rd., Irvine, CA 92618, Attn: Editor, *K-Tech News.*

KVF400 Drive Belt Deflection Adjustment



by Keith Pestonik
Senior Product Quality Engineer

Depending on your experience with Belt Drive Torque Converter or CVT (Continuously Variable Transmission) systems, you may or may not be familiar with the term "Belt Deflection." It refers to how much slack the belt has when the torque converters are in the at-rest (neutral) position. The amount of belt deflection can have a significant effect on the performance characteristics of the vehicle. Simply put, as belt deflection **increases** (which occurs normally as the belt wears), vehicle performance **decreases.** If belt deflection becomes excessive, the vehicle will suffer a noticeable loss in acceleration and possibly top speed.

Our MULE™ products use CVT drive systems, but there is no way to adjust belt deflection. As the belt wears, it becomes narrower, causing it to drop deeper between the driven converter sheaves in the neutral position. This change results in increased belt deflection. Eventually the customer may complain of poor performance. The only way to regain the original performance is to replace the worn parts (usually the belt).

On the KVF400 Prairie, belt deflection is adjustable -a most welcome feature. We have found that if belt deflection is greater than 30mm, the Prairie may exhibit some "flat spots" when accelerating from a stop to top speed. The first will occur immediately off idle and may feel like a throttle hesitation or "bog," when in fact the excessive belt deflection is just causing the vehicle to take off at too high a gear ratio. The second flat spot occurs just before the vehicle reaches top speed. In this case, the excessive belt deflection allows the torque converters to upshift fully too quickly (before the vehicle has reached the proper speed). Engine rpm drops momentarily and the rider feels a flat spot in acceleration. This is especially noticeable in high load conditions such as climbing a grade.

To measure belt deflection, you must first remove the torque converter outer cover. See that the driven converter is in true neutral. Select "Neutral" with the shift lever and rotate the driven converter by hand. Then rotate the belt counterclockwise to make sure it is loose in the driven converter. Lay a straight edge on the top run of the belt spanning both converters (see the above illustration). Now push down **firmly** on the belt with a rigid metal ruler and note the gap between the belt and the straight edge. Experiment with ruler position to get the largest reading. That gap is the belt deflection.

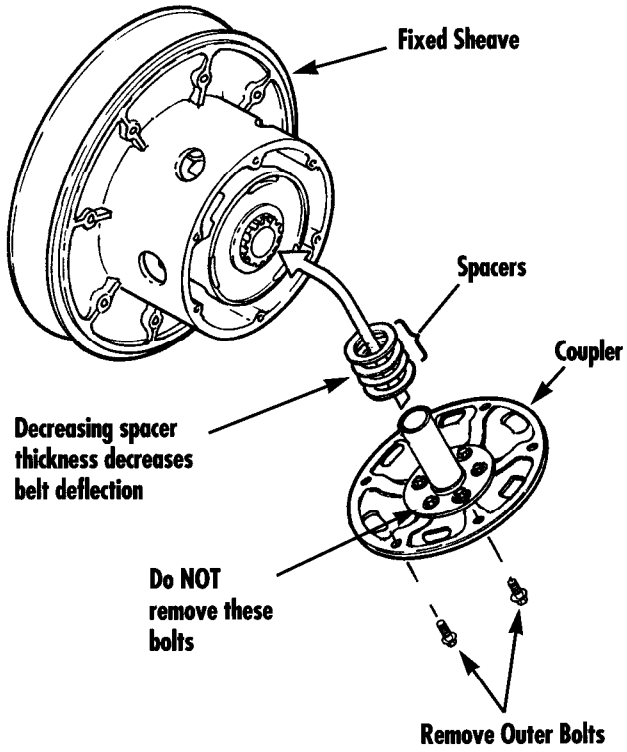
For best performance, we have found that belt deflection on the KVF400 should be 25 - 30mm (the closer to 25mm the better). Less than 25mm of belt deflection could result in the vehicle creeping at idle and gears grinding when shifting from neutral into forward or reverse.

Drive Belt

continued from page 8

Belt deflection will increase during initial break-in of a new belt, so adjustments should always be done with a "worn-in" belt. We strongly suggest you check and adjust belt deflection at the first service interval.

Adjustment of belt deflection on the 400 Prairie is not too tough. Assuming you already have the torque converter cover off to measure the belt deflection, remove the center mounting bolt for the **driven converter.** *Note: this bolt has left hand threads. Remove the bolt by turning it clockwise.* Remove the six outer bolts holding the coupler to the fixed sheave. Remove the coupler. **Be careful not to lose the spacers under it.** These spacers (or shims) come in three thicknesses (.8mm, l.0mm, and 1.6mm). Varying the number and thickness of these spacers is how you adjust belt deflection. **Reducing** the spacer stack **decreases** belt deflection. The rule-of-thumb is: lmm change in spacer thickness equals about 10mm change in belt deflection. If you remove a lmm spacer, you can expect about a 10mm reduction in belt deflection.



On reassembly, make certain you align the arrow on the coupler with the arrow on the fixed sheave. All driven and drive converters are balanced as assemblies. Any time you disassemble one, make sure you reassemble it exactly as it came apart. All major parts have alignment arrows cast or punched into them.◆

KVF400 Prairie Torque Converter Rattle

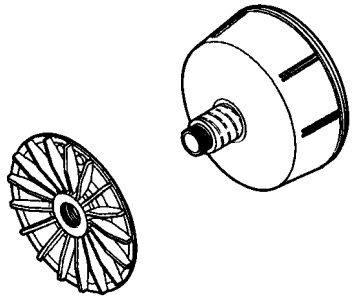
by Gregg Thompson
Product Support Supervisor

We've had a few calls from dealers who described a rattling or ringing noise, primarily on deceleration, coming from the torque converter area of new Prairie 400s. Sometimes the dealer described the noise as coming from the center of the vehicle in front of the rider. In most cases, the noise went away immediately when the rider began to accelerate and returned on deceleration.

In the cases where the noise was heard from in front of the fuel tank, it turned out the noise was being broadcast from the torque converter inlet snorkel. The actual source of the noise was the drive torque converter.

In each case, the dealer discovered that the fixed sheave on the drive converter had loosened and partially unscrewed from the center shaft. As it unscrewed on the shaft, it moved inward and contacted the fan shroud and the seal holder bolts.

To fix one of these, you must remove the drive converter and remove (unscrew) the fixed sheave from the center shaft. Then clean the threads on both parts and retighten the sheave onto the center shaft using a permanent locking agent (Red Loctite). The service manual describes a holder you can make in your shop for working on the driven converter. This same holder or something similar can be used to hold the fixed sheave of the drive converter while you tighten it.◆

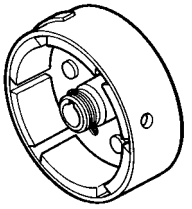


One Spark KLF220s

by Shannon Beeson
Product Support Specialist

Recently, we on the Hotline have begun to receive reports of a strange and seemingly incurable no-spark condition on KLF220s. Typically, dealers report that these units have no spark when cranking, but when the starter button is released, the ignition will spark one time. In efforts to repair this problem, dealers have gone through all of the required checks, replaced stators and igniters, and sometimes even wiring harness, but still have the same problem. Over the course of time, we have found that replacing the flywheel cures these strange no-spark units when nothing else seems to help. Occasionally, we will hear that the bad flywheel has a crack in one of the magnets or another noticeable defect, but more often than not the flywheel looks perfectly fine.

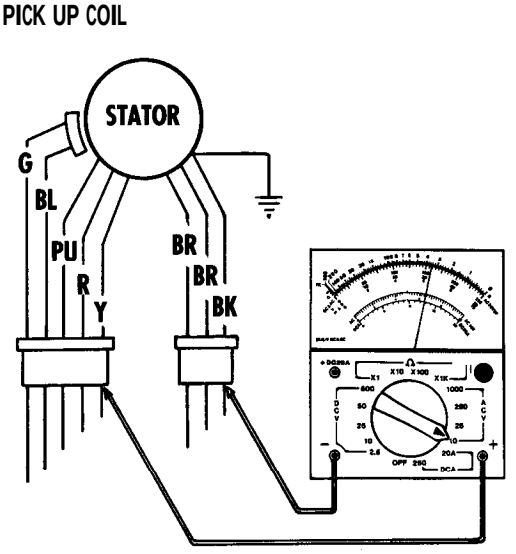
Although we have encountered this type of failure several times, remember that this symptom can also be caused by a bad stator or igniter, and therefore all of the normal electrical checks should be performed before replacing the flywheel. However, if you do encounter a unit which nothing else seems to fix, taking time to switch the flywheel may help you cure a seemingly incurable problem. ◆



Jet Ski® Watercraft Ignition Testing

by Rob Taylor
Instructional Designer/Instructor

Troubleshooting electrical problems can often be challenging, especially when the service manual has errors or omissions that tend to add to the confusion. Such is the case with both the 900 and 1100 ZXi and STX Jet Ski® watercraft. If a unit has an ignition problem that requires trouble-shooting of the stator, you will find a yellow wire, not present on other Jet Ski watercraft stators, and the service manual doesn't say much about it.



This "extra" yellow wire is an exciter coil wire. There are three exciter coil wires on these models instead of the customary two (red and purple) wires. Why are there three wires coming from the exciter coil? Because there are two exciter coils, one high speed and one low speed. The high-speed coil has only one AC lead, which is yellow. The other end of the coil is grounded. The low-speed coil has two AC leads, red and purple. To check the resistance on the low-speed coil, connect the tester leads between the red and purple wires. For the high-speed coil, connect one lead from the tester to the yellow wire and the other lead to ground. There is a table in the service manual giving the resistance specifications for these coils, but it's sort of hidden in the "Charging System" section instead of the "Ignition System" section.

What the service manuals don't offer are AC voltage specs for these coils. We believe that voltage tests are better than resistance tests for finding coil failures. So we took some in-circuit voltage readings of our own from a known good ignition. We did these tests with both analog and digital meters (to check for consistency).

Here's what we found:

These tests were done at cranking speeds with all ignition wires connected and the spark plug wires removed from the plugs and grounded. Readings may vary slightly from boat to boat and meter to meter.

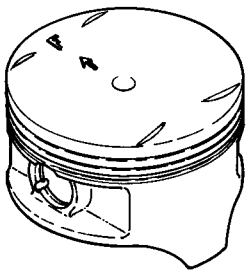
COIL	CONNECTIONS	VOLTAGE
Low speed	red ◄► purple	60-75 VAC
High speed	yellow ◄► black	6.5-7.5 VAC

The purpose of this second exciter coil is to supply additional voltage to the capacitor in the igniter box at high rpm. A high rpm running problem could be caused by either coil being faulty, so be sure to check both coils. Unfortunately, if either one of these coils is bad, the whole stator assembly must be replaced. ◆

A Quieter Ride

by Gregg Thompson
Product Support Supervisor

The VN1500 A and C model piston, rings and wrist pin have undergone some changes for 1997 to reduce oil consumption and engine noise.



The most obvious difference between the old and new pistons is the new piston (P/N 13001-1469) no longer has the dark grey (Ahunite) surface treatment to the ring land and piston crown area. There are also some very minor machining changes to the new piston. The ring end gap has been reduced and also the end gap manufacturing tolerance has been tightened up slightly on the new rings (P/N 13008-1172). The new end gap specs are as follows:

Top Ring ... 0.3 - 0.4mm
Second Ring ... 0.4 - 0.55mm

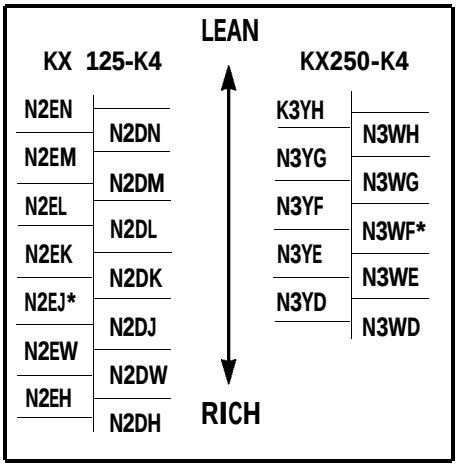
To reduce mechanical noise, two things have been done. First, the new wrist pin (P/N 13002-1107) is about .015mm larger in diameter than the old one, resulting in a tighter fit in the piston. Second, the marking on top of the piston has been changed from just an arrow to an arrow **and** an "F."

How does changing the marking on top of the piston change engine noise, you ask? That's a good question with a strange answer. The old piston was intended to be installed with the arrow pointing toward the exhaust (forward in the front cylinder and rearward in the rear cylinder). This was done to match the asymmetrical valve pockets with the correct (intake or exhaust) valves. The problem with that arrangement was that the wrist pin hole is machined offset to reduce piston noise. Installing the pistons this way means the rear piston pin offset is backwards relative to crankshaft rotation, defeating the purpose of the offset (just in the rear cylinder).

The new piston has an arrow and an "F" indicating the arrow should point **forward.** Installing both pistons with the arrow pointing forward results in both pistons having correct piston pin offset, thereby reducing piston noise. It turns out the difference in the valve pocket sizes is insignificant. ◆

KXl25 and 250 Jet Needles

by David Pyle
Parts Data
Coordinator



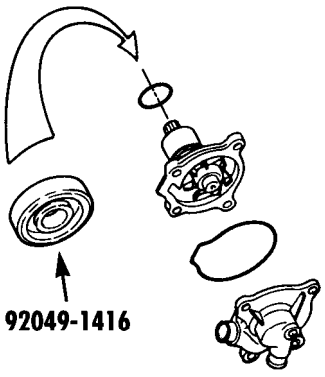
We have new KXs and once again new jet needles. The following information should make choosing an optional needle easier.

Each model has two groups of needles available. For each model, these groups are just l/2 clip position (0.5mm) different from each other. For example, on the KX250, the N3YF is l/2 clip position leaner than the OEM standard N3WF. The jet needle chart in the owners manual does not list the needles in a true "Leanest to Richest" order because it does not take into consideration this half-step difference between the two groups.

The chart above shows the needles available for each model in the correct order from leanest (top) to the richest (bottom). Keep in mind that each needle is only l/2 clip position different from the one higher or lower on the chart. Refer to the microfiche to get the part number of any needle you may want to order. The (*) indicates the standard needle. ◆

Sealed Tight!

by Gregg Thompson
Product Support Supervisor



On the Hotline, we've had lots of requests over the years for the little oil seal in the Ninja-style water pumps. Until now the answer has always been, "sorry...we don't know how to get one." However, we recently discovered that this seal has quietly showed up on the microfiche cards for the ZGl000-A7 through A12.

The part number is 92049-1416. We believe this one seal fits all the Ninja-style water pumps. ◆

Championship Bikes

Continued from page 3

power. Like the '97, second and third gear ratios are taller and the final gearing was lowered to a 14/53 for supercross (Ryno used a 14/54!) and usually a 14/50 for motocross.

The team tuners test throughout the year and give their successful efforts to Albrecht and Emig for personal testing. The team had a breakthrough before the St. Louis supercross with a Keihin PWK powerjet carburetor. The powerjet uses an electric solenoid tied to the ignition to open an extra fuel passageway. The powerjet, combined with the main jet, flow the same amount of fuel at low rpms as a normal car-b's main jet. The powerjet closes to lean the fuel mixture at a prescribed rpm after peak power is achieved (usually 7500 - 8100rpm on Emig's KX250). This gives the bike more top-end power. Plug-in digital chips at the igniter alter the shut-off point.

A new cylinder and pipe combination was developed before the Budds Creek motocross that Asch says found the perfect compromise between controllability and acceleration. Leef explained that improved

Bridgestone tires also played a key role. These changes helped Emig start his unmatched holeshot streak and are the basis for all the team riders 1997 race bikes. Apparently the engine is so good, the exact motor is used for motocross and supercross with only gearing changes!

How does Emig relate to the bike? Albrecht says Emig is very easy on the equipment with his smooth riding style. Leef adds that Jeff likes his suspension in the middle-of-the-road, stiffer than Huffman but much softer than Kiedrowski, LaRocco, or Hughes. Asch says Emig has an ability to perceive how quickly the bike is moving forward, not just how fast the motor feels, Hard-hitting bikes feel fast, but usually don't get the best lap times or starts. Emig's bike is smooth and fast.

When do we get to ride this bike? The race team says the '97 KX250 is as close as it gets. If you like the performance of the '97 KX250, give the race team tuners the thumbs up a the next race.◆

Notice the extra gusset plate with two holes near the upper shock mount.

Unbelievably smooth rolled cone pipe, sand-cast magnesium side cover, and high- and low-speed compression adjusters are highlights.